

experimented with, in a similar manner, exactly the same results occurred.

134. Whenever the current passed in these cases, there was decomposition of the substances; but the electro-chemical part of this subject I purpose connecting with more general views in a future paper.¹

135. Other substances, which could not be melted on glass, were fused by the lamp and blowpipe on platina connected with one pole of the battery, and then a wire, connected with the other, dipped into them. In this way chloride of sodium, sulphate of soda, protoxide of lead, mixed carbonates of potash and soda, etc., etc., exhibited exactly the same phenomena as those already described: whilst liquid, they conducted and were decomposed; whilst solid, though very hot, they insulated the battery current even when four troughs were used.

136. Occasionally the substances were contained in small bent tubes of green glass, and when



fused, the platina poles introduced, one on each side. In such cases the same general results as those already described were procured; but a further advantage was obtained, namely, that whilst the substance was conducting and suffering

decomposition, the final arrangement of the elements could be observed. Thus, iodides of potassium and lead gave iodine at the positive pole, and potassium or lead at the negative pole. Chlorides of lead and silver gave chlorine at the positive, and metals at the negative pole. Nitre and chlorate of potassa gave oxygen, etc., at the positive, and alkali, or even potassium, at the negative pole.

137. A fourth arrangement was used for substances requiring very high temperatures for their fusion. A platina wire was connected with one pole of the battery; its extremity bent into a small ring, in the manner described by Berzelius, for blow-pipe experiments; a little of the salt, glass, or other substance,

¹ In 1801, Sir H. Davy knew that "dry nitre, caustic potash, and soda are conductors of galvanism when rendered fluid by a high degree of heat" (*Journals of the Royal Institution*, 1802, p. 53), but was not aware of the general law which I have been engaged in developing. It

is
that eleven years after that, he should say, " There are no remarkable,
fluids known
except such as contain water, which are capable of being
made the medium
of connection between the metal or metals of the voltaic
apparatus."—
Elements of Chemical Philosophy, p. 169.1*